

Old Con-X Objectives for X-ray Binaries

- “Use X-ray radial velocity measurements to determine the mass function of black holes, neutron stars, and white dwarfs in binary systems.”
 - _ *For the vast majority of systems, this will be done with narrow Bowen fluorescence lines from the companion.*
- “Measure the gravitational redshift at the surface of white dwarfs in magnetic CVs using the Fe K fluorescence lines.”
 - _ *Resolution of ~3000 is needed.*

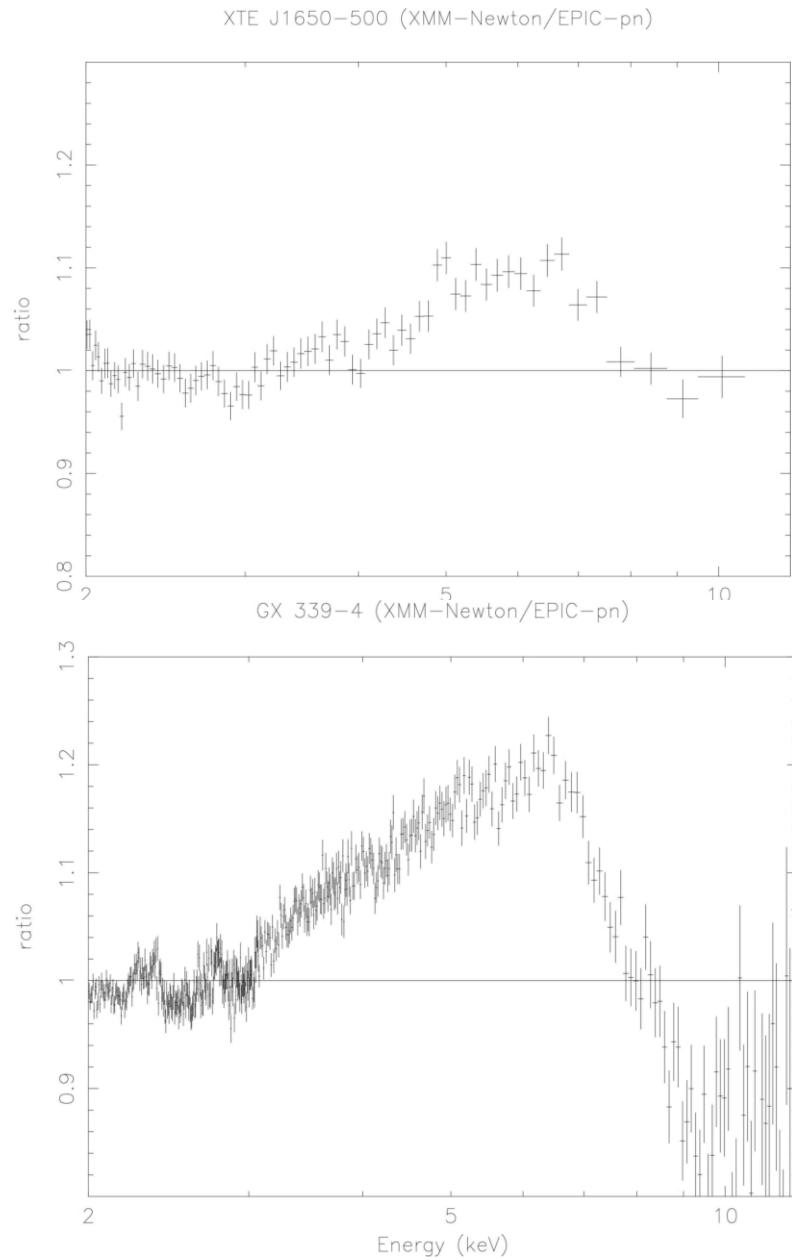
New Objectives for Galactic Black Holes

- Search for black hole spin, range of spin parameters via skewed Fe K lines. Search for other skewed lines.
- Probe the corona-disk interaction: quasi-spherical corona, pancake, or magnetic flaring loops?
- Determine the nature of low-luminosity flows: ADAF, jet, or ADAF+jet, and where is the disk?

Relativistic Fe K Lines

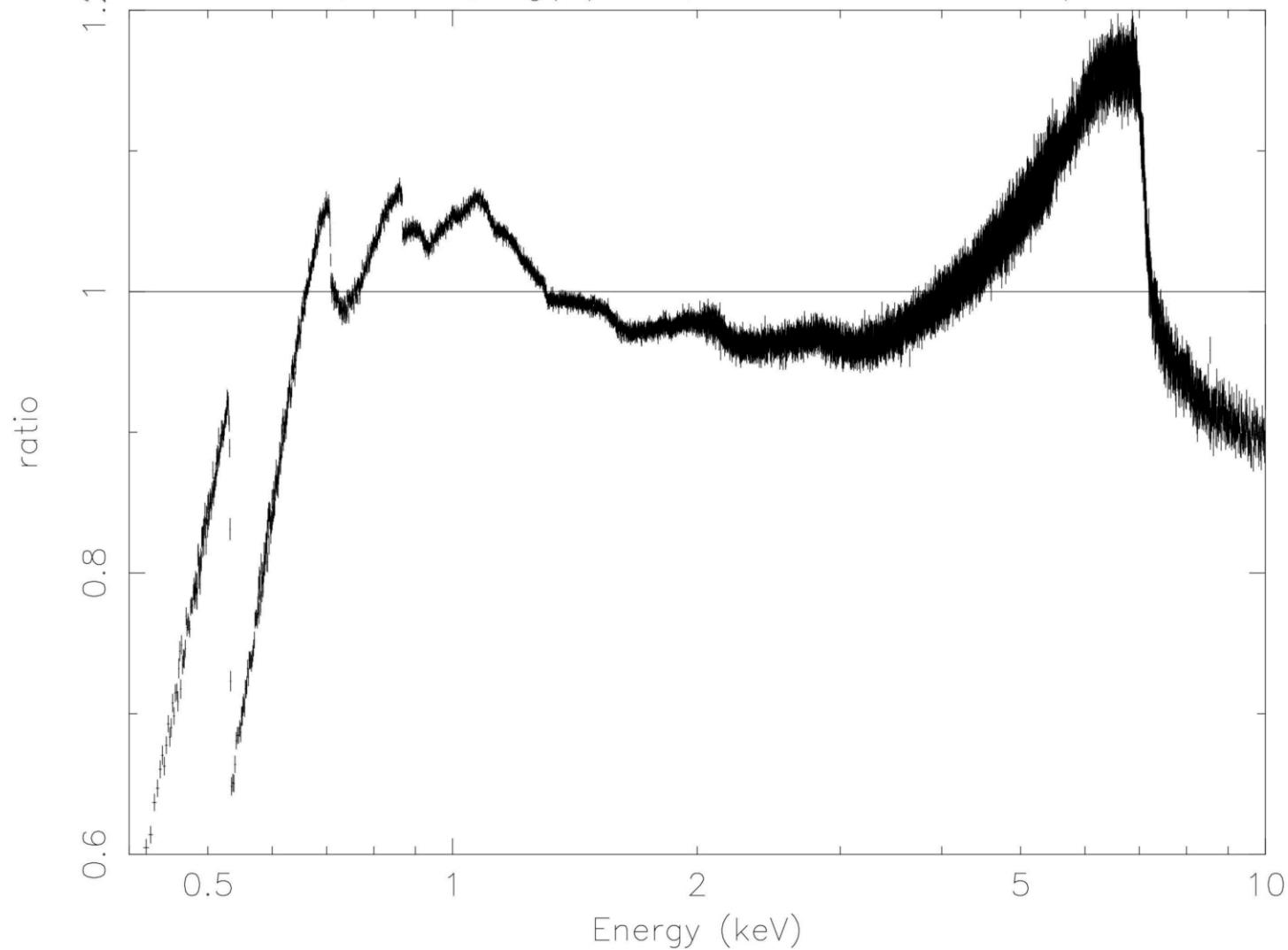
- Rule-out 6 R_grav.
 - _ $R = 1.24 \text{ R}_{\text{grav}}$.
- Rule-out $q = 3$, $J(r) = r^{(-q)}$
 - _ $q = 5.5-6$
- Simultaneous [Chandra/XMM-N] and RXTE for continuum.
 - _ Lines are largely independent of the continuum model chosen.

We need to be able to handle ~1 Crab sources.

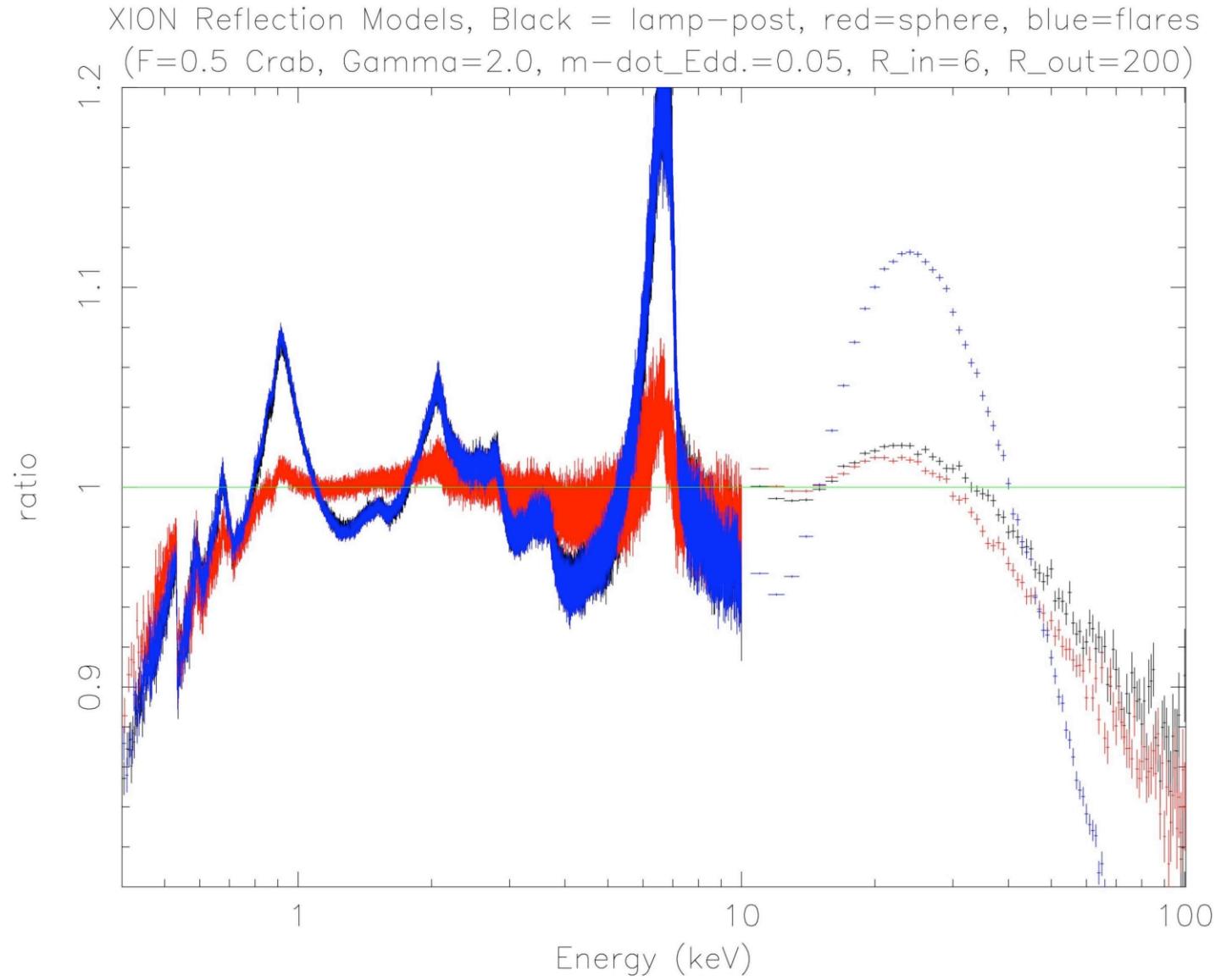


Multiple Relativistic Lines

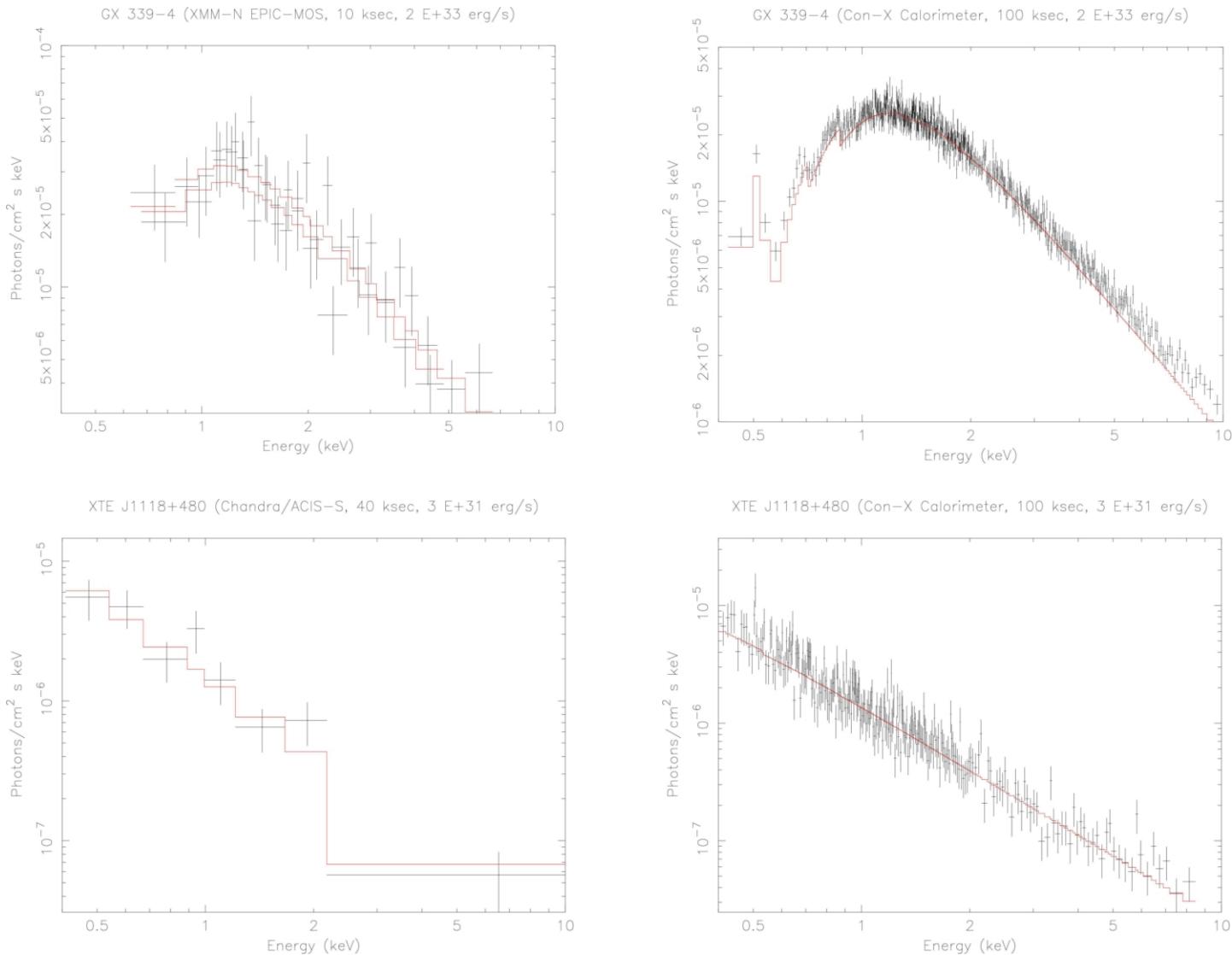
Con-X Calorimeter: 1 Crab (Kerr BH) 100 ksec Reflection Spectrum
Gamma = 2, R = 1, log(xi) = 3, model: Gamma = 2 power-law



The Disk-Corona Interaction



Galactic Black Holes in Quiescence



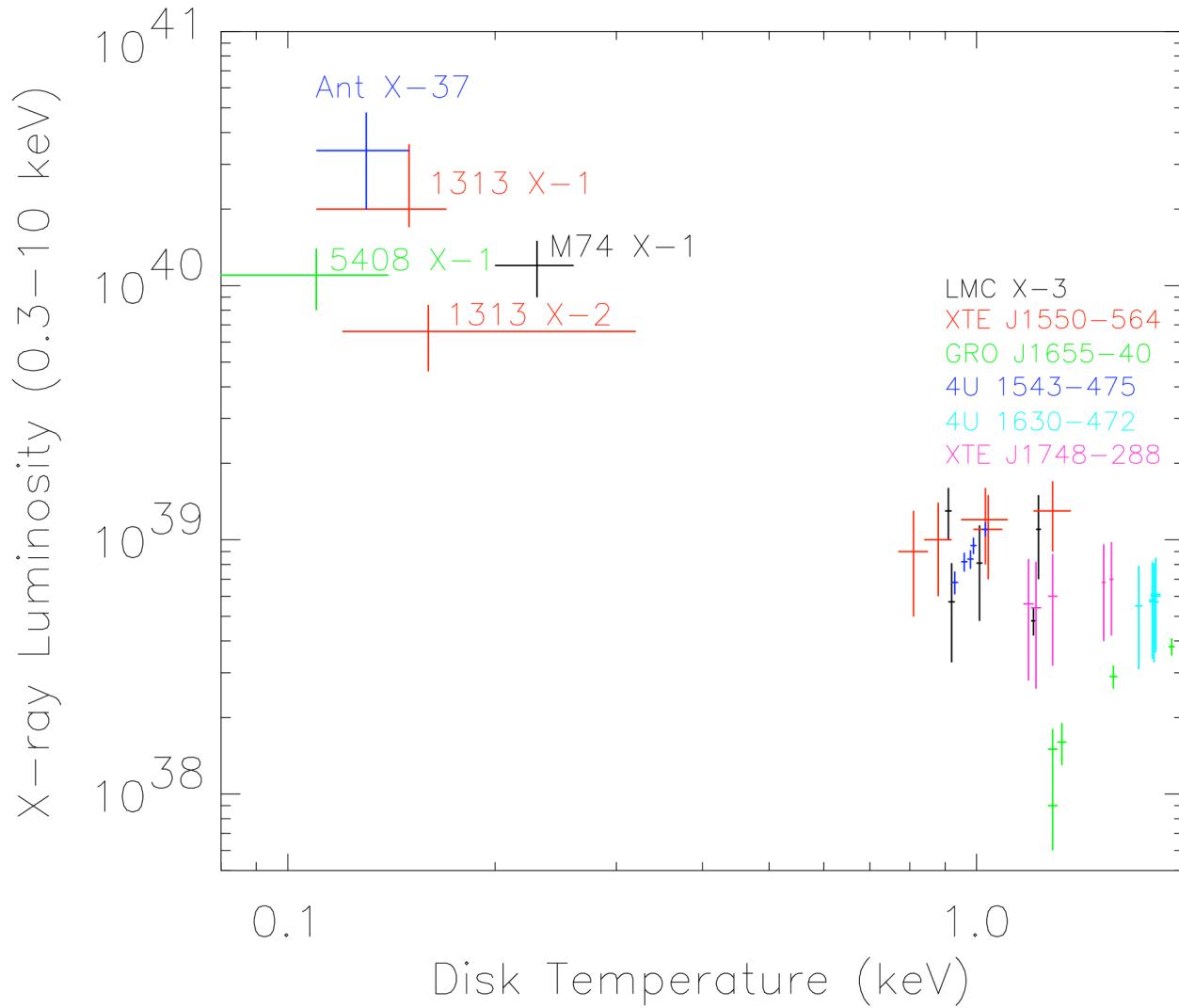
Con-X Will be Revolutionary for GBHs

- Spin may be revealed with multiple relativistic lines.
- Even more exotic physics may be probed (B-Z effect).
- The jet ejection mechanism can be constrained by probing the coronal geometry, corona-disk interaction.
- Multiple-component spectra in quiescent systems.

We need to be able to handle 1 Crab sources, whether through calorimeter design, defocusing, or both.

(won't someone please ask me about ULXs / IMBHs?)

Con-X: The Machine for ULXs



Con-X Will Reveal Reflection in ULXs

NGC 1313 X-1: $L_X = 2 E+40$
Disk Temp: 150 eV

